



Research Article

REVEALED COMPARATIVE ADVANTAGE OF EXPORT OF AGRICULTURAL PRODUCT IN INDIA

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Abstract: The aim of this study is to examine comparative advantages of the agriculture commodities export during 2007 to 2016 from India. The study used Balassa index to measure comparative advantages of agricultural commodities of India. India enjoyed highly comparative advantages and specialization in export of guar gum in all commodities. The maize, fresh onion, fresh fruits decidi, dried pea, cucumber and gherkins, dried lentil, dried chickpea, dried and preserved vegetables, groundnut, soy bean oil, edible treenut, cotton, natural honey and buffalo meat examined strong comparative advantage in world agriculture trade.

Keywords: Agricultural commodities, Competitiveness, Specialization, Revealed Comparative Advantage, Balassa Index

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Introduction

India is a major supplier of several agricultural commodities like tea, coffee, rice, spices, cashew, oil meals, fresh fruits, fresh vegetables, meat and its preparations and marine products to the international market. Export has assumed an important place in the development process of any economy. The three important sources of foreign exchanges are-export earning, foreign aids and foreign investment. Due to the heavy restrictive conditions imposed by the donor countries, the prospects of foreign aids are not bright. The principle of comparative advantage (CA) is one of the most important concepts in the theory of international trade. There are many definitions in the domain of comparative advantage in the literature. Among the most accepted ones is: "A margin of superiority in a production of a good or service where the opportunity cost of production is lower". The definition itself implies that all the countries will produce and export the products where they enjoy cost efficiency, leading to a perfect allocation of resources, applying the principle of "laissez-faire"

Data and Methodology

The present study is based on secondary data. The secondary data for a period from 2007-16 were collected from United States Department of Agriculture (USDA) in US\$ of thousand and APEDA. The trade data were classified in to five groups (1) Cereals (2) Fresh fruits and vegetables (3) Processed fruits and vegetables (4) Other processed foods (5) Animal products as per the classification of APEDA.

Revealed Comparative Advantage (RCA)

In the study, Balassa's (1965) [1] measure of relative export performance by country and industry/commodity, defined as a country's share of world exports of a commodity divided by its share of total world agricultural exports. The index for country i commodity j is calculated as follows,

$$RCA = \frac{X_{ij} / \sum X_{ij}}{X_{iw} / \sum X_{iw}}$$

Where,

X_{ij} = Country's export of commodity j

$\sum X_{ij}$ = Total export of country i

X_{iw} = world export of commodity j

$\sum X_{iw}$ = Total world Agricultural export i

The purpose for taking world agricultural export was to specify the specialization and comparative advantage over the agro industry in world. If it takes a value greater than unity, the country has a revealed comparative advantage in that product. For better understanding and comparisons Hinojosa and Van Marrewijk (2001) [2] proposed the classification of the Balassa-index as:

Category A, $0 < B \leq 1$ (Product groups with a lack of comparative advantage)

Category B, $1 < B \leq 2$ (Product groups with a weak comparative advantage)

Category C, $2 < B \leq 4$ (Product groups with an average comparative advantage)

Category D, $4 < B$ (Product groups with a very strong comparative advantage)

Results and Discussion

The value of RCA for cereals, fresh and processed fruits and vegetables were presented in [Table-1].

Cereals

The values of RCA for maize during study period was more than one except 2015 (0.70) and 2016 (0.43) but an average RCA value show strong comparative advantages over world agricultural export. The values of RCA for rice were less than one from 2007 to 2016, which indicates a lack of comparative advantage towards rice export in global market.

Fresh Fruits and Vegetables

The average value of RCA for fresh onion (27.23) and fresh fruits, decidi (4.86) indicated strong comparative advantages over world agricultural market. The average value of RCA was 2.94 for grapes indicated that India had enjoyed

Revealed Comparative Advantage of Export of Agricultural Product in India

Table-1 Revealed comparative advantage for cereals, fresh and processed fruits & vegetables

YEAR	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
Cereals											
Maize	6.11	6.76	4.47	5.74	6.68	7.18	5.43	3.29	0.7	0.43	4.68
Rice	0.04	0.002	0.04	0.01	0.05	0.03	0.15	0.03	0.04	0.04	0.04
Fresh fruits & vegetables											
Fresh onion	23.52	47.74	40.43	25.18	26.55	27.67	30.61	20.85	16.21	13.56	27.23
Fresh fruits, decidi	4.41	3.12	3.99	3.79	7.83	6.91	5.28	4.42	5.45	3.42	4.86
Fresh grapes	2.45	2.95	2.56	2.04	2.91	4.54	5.18	2.76	2.97	1	2.94
Fresh fruits, citrus	0.07	0.44	0.16	0.72	1.94	0.7	0.14	0.13	0.03	0.01	0.37
Processed fruits & vegetables											
Dried pea	86.23	77.5	54.86	59.32	39.56	64.73	49.7	71.02	44.08	39.96	58.7
Cucumber and gherkins	43.89	76.95	38.96	34.44	52.84	43.72	42.92	44.2	29.13	16.89	42.39
Dried lentil	7.82	1.77	58.97	35.24	17.72	31.07	62.62	80	47.53	28.49	37.12
Dried chickpea	8.31	5.16	62.24	30.89	20.13	23.17	4	25.89	13.19	11.39	20.44
Fruits and veg. seeds	1.75	1.38	1.08	1.41	2.05	1.83	1.96	1.7	1.47	0.92	1.55
Dried and preserved veg.	6.51	4.62	4.63	5.45	7.46	7.83	7.81	7.05	5.64	3.77	6.08
Dried bean	3.38	2.35	0.58	1.08	0.39	0.12	2.22	0.61	0.59	0.61	1.19
Fruits and preparation	1.58	1.22	1.45	1.46	2.03	2.72	2.03	1.71	2.02	1.33	1.85
Peanut butter	1	1.72	4.35	2.93	3.39	2.45	1.32	0.55	0.53	0.54	1.88
Fruit juice	0.02	0.11	0.08	0.06	0.27	0.16	0.16	0.07	0.1	0.25	0.13

Table-2 Status of Revealed comparative advantage for cereals, fresh and processed fruits & vegetables

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
Cereals											
Maize	S	S	S	S	S	S	S	A	L*	L	S
Rice	L	L	L	L	L	L	L	L	L	L	L
Fresh fruits & vegetables											
Fresh onion	S	S	S	S	S	S	S	S	S	S	S
Fresh fruits, decidi	S	A	A	A	S	S	S	S	S	A	S
Fresh grapes	A	A	A	A	A	S	S	A	A	W	A
Fresh fruits, citrus	L	L	L	L	W	L	L	L	L	L	L
Processed fruits & vegetables											
Dried pea	S	S	S	S	S	S	S	S	S	S	S
Cucumber and gherkins	S	S	S	S	S	S	S	S	S	S	S
Dried lentil	S	W	S	S	S	S	S	S	S	S	S
Dried chickpea	S	S	S	S	S	S	A	S	S	S	S
Fruits and veg. seeds	W	W	W	W	A	W	W	W	W	L	W
Dried and preserved vegetables	S	S	S	S	S	S	S	S	S	A	S
Dried bean	A	A	L	W	L	L	A	L	L	L	A
Fruits and preparation	W	W	W	W	A	A	A	W	A	W	W
Pea nut butter	W	W	S	A	A	A	W	L	L	L	W
Fruit juice	L	L	L	L	L	L	L	L	L	L	L

Table-3 Revealed comparative advantage for other processed foods and animal products

YEAR	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
Other processed foods											
Guar gum	97.19	111.85	74.59	156.63	440.94	154.85	143.07	122.5	50.95	44.3	139.69
Groundnut	40.91	37.39	34.07	46.18	93.3	48.03	35.26	48.42	29.93	17.09	43.06
Walnut	3.72	3	2.98	2.35	3.12	1.94	2.64	0.83	0.47	0.13	2.12
Pulses	5.96	4.67	2.21	4.7	5.8	4.78	5.81	3.45	2.89	1.25	4.15
Soybean oil	3.33	0.01	19.1	15.24	0.02	15.28	5.89	0.01	0.01	0.03	5.89
Edible tree nut	12.41	14.51	8.4	9.77	12.17	9.33	9.21	9.64	8.98	8.06	10.25
Milled products	2.31	1.38	1.32	1.91	2.92	4.17	6	5.16	4.08	2.64	3.19
Cotton	10.28	18.91	9.17	2.24	2.55	2.38	5.21	1.79	1.72	0.24	5.45
Cotton linters and waste	3.73	5.77	5.22	2.11	2.33	2.15	3.04	3.31	3.72	7.75	3.91
Spices	2.08	2.06	1.93	1.24	2.17	2.11	2.11	2.58	1.2	1.03	1.85
Cocoa and products	0.07	0.35	0.06	0.39	0.53	0.2	0.46	0.57	0.74	0.92	0.43
Castor oil	1	1.04	1.13	0.61	0.15	0.2	0.35	1.06	1.83	1.38	0.88
Soybean cake and meal	0.01	0.01	0.03	0.04	0.02	0.01	0.02	0.01	0.01	0.04	0.02
Oilseed and products	0.28	0.1	0.93	1.1	0.19	0.64	0.3	0.13	0.17	0.17	0.4
Tea, Incl Herbal Tea	0.4	0.53	0.2	0.07	0.32	0.2	0.25	0.67	0.41	0.35	0.34
Coffee and products	0.02	0.01	0.21	0.1	0.09	0.05	0.1	0.03	0.05	0.03	0.07
Animal products											
Natural honey	5.5	6.93	4.14	8.04	8.48	7.02	7.06	6.24	5.92	2.86	6.22
Sheep/Goat meat	1.63	5.79	5.88	2.05	1.76	2.47	3.3	2.99	2.53	1.86	2.63
Buffalo meat	7.16	8.9	6.94	11	16.41	15.92	20.32	17.46	11.91	8.31	12.43

average comparative advantage over world agricultural export market throughout the study period. The average value of RCA was 0.37 for fresh fruits citrus throughout the study period. In the year from 2013 to 2016 the RCA value showed lack of comparative advantage.

Processed Fruits and Vegetables

The average value of RCA was 58.70 which indicate that India had very strong comparative advantages and had specialization in export of dried pea over world agricultural market.

Table-4 Status of revealed comparative advantage for other processed foods and animal products

YEAR	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
Other processed foods											
Guar gum	S	S	S	S	S	S	S	S	S	S	S
Groundnut	S	S	S	S	S	S	S	S	S	S	S
Walnut	A	A	A	A	A	W	A	L	L	L	A
Pulse	S	S	A	S	S	S	S	A	A	W	S
Soybean oil	A	L	S	S	L	S	S	L	L	L	S
Edible tree nut	S	S	S	S	S	S	S	S	S	S	S
Milled products	A	W	W	W	A	S	S	S	S	A	A
Cotton	S	S	S	A	A	A	S	W	W	L	S
Cotton linters and waste	A	S	S	A	A	A	A	A	A	S	A
Spices	A	A	W	W	A	A	A	A	W	W	A
Cocoa and cocoa prod.	L	L	L	L	L	L	L	L	L	L	L
Castor oil	W	W	W	L	L	L	L	W	W	W	L
Soybean cake and meal	L	L	L	L	L	L	L	L	L	L	L
Oilseed and products	L	L	L	W	L	L	L	L	L	L	L
Tea, Incl Herbal Tea	L	L	L	L	L	L	L	L	L	L	L
Coffee and coffee prod.	L	L	L	L	L	L	L	L	L	L	L
Animal products											
Natural honey	S	S	S	S	S	S	S	S	S	A	S
Sheep/Goat meat	W	S	S	A	W	A	A	A	A	W	A
Buffalo meat	S	S	S	S	S	S	S	S	S	S	S

The value of RCA was highest in 2007 (86.23) and gradually decreasing till 2011 (39.56). During 2016, RCA value decreased to 39.56. In cucumber and gherkins, the value of RCA was highest in the year 2008 which was 76.95 and after that remained constant between the years of 2009-2014, which shows strong specialization in the export over world market. During the year 2011 to 2014, the value of RCA ranged between 17.72 to 80.00, which indicates that India have strong specialization in the export of dried lentil over world market. The [Table-1] also revealed that except 2013 (4.00), the value of RCA had very strong specialization in export of dried chickpea in world agricultural market. During 2007-2016 the range of RCA was 1.75 to 0.92 which indicate that India had weak comparative advantage in export of fresh and vegetables seeds. During the study period, India had enjoyed strong comparative advantage in export of dried and preserved vegetables. In dried beans, fruits and preparation, pea nut butter, fruit juice the average value of RCA for dried beans (1.19), fruits and preparation (1.85) and peanut butter (1.88) had indicated weak comparative advantages over the world agricultural market.

Other Processed Foods

The value of RCA of other processed food and animal products were presented in [Table-3]. The average value of RCA was 139.69, which indicates that India had very strong comparative advantages and had shown specialization in export of guar gum over world agricultural market. During the year 2009 to 2016, the value of RCA ranged between 34.07 to 17.09, which indicates that India had specialization in the export of groundnut over world agricultural market. In case of walnut the RCA value was weak and had average kind of comparative advantage. But during 2014 (0.83) to 2016 (0.13), it could be seen that India experienced comparative disadvantage in export of walnut. The value of RCA was gradually decreasing in pulse from 2013 (5.81) to 2016 (1.25). The average value of RCA for pulses was 4.15, which indicates that India had enjoyed strong comparative advantage over world export market. Mixed trend was observed in export of soybean oil in global. India enjoyed strong comparative advantage in 2009 (19.10) to 2013 (5.89). India experienced lack of comparative for the export of soybean oil after 2014. India shows very strong comparative advantage in export of edible tree nut as the average RCA value was 10.25 and from the year 2009 (8.40) to 2016 (8.06) stable trend was seen. The average value of RCA for milled products was 3.19, which indicates that India had enjoyed average comparative advantage. India had strong specialization and comparative advantages in 2007 to 2009 for export of cotton. But after that India had average comparative advantage in all the years except 2016. India enjoyed average comparative advantage in export of cotton, linters and waste in world agriculture market. From 2007-2016, the average value of RCA for spices was 1.85, which indicates that India had weak comparative advantage in export of spices in world agriculture market. India had

lack of comparative advantage in export of cocoa products during the entire study period. India had lack of comparative advantage in export of castor oil during 2010 (0.61) to 2013 (0.35). Soybean cake and meal, oilseeds and products, Tea, including herbal tea and coffee and coffee products India had lack of comparative advantage in export of these commodities during the entire study period as the RCA values were less than one.

Animal Products

India had strong comparative advantage in export of natural honey in world agriculture market. The range of RCA was observed 8.48 (2011) to 2.86 (2016) during study period. The average value of RCA for sheep/goat meat was 2.63 indicated that India enjoyed average comparative advantage in export of sheep/goat meat in world agriculture market. The average value of RCA for buffalo meat was 12.43 which showed that India had strong comparative advantage. Leua *et al.* (2017) [3] found that India had specialization in export of rice, groundnut, fresh onion and cucumber and gherkins and in case of wheat, India had improved its position of export in global market from 2012-2016.

Policy Implication

The commodities like pulse, oilseed and products, fruits juice, spices, peanut butter, rice, cocoa and cocoa products, dried chickpea were shown poor to very poor performance in the world agricultural market. Need to increase focus on these commodities by create awareness about export procedure quality parameter, phytosanitary measures *etc.* Need to developed appropriate infrastructure to remove technological gap in processing, development of cold chain, packing material *etc.*

Conclusion

The study had shown that exports of various agricultural commodities from India had responded differently in terms of comparative advantage during the 2007-16 period. India had enjoyed a comparative advantage in maize, fresh onion, fresh fruits decidi, dried pea, cucumber and gherkins, dried lentil, dried chickpea, guar gum, groundnut, pulse, edible tree nut, natural honey and buffalo meat. A gradual decline in India 's comparative advantage had been depicted for exports of pea nut butter, fresh fruits citrus and dried and preserved vegetables.

Application of research:

This study will be helpful to know the comparative advantage of various agriculture commodities and specialization in international market in policy making by the various government institutions

Research Category: Agribusiness Management

Abbreviations:

RCA - Revealed Comparative Advantage

USDA- United States Department of Agriculture

APEDA- Agricultural & Processed Food Products Export Development Authority

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Study area / Sample Collection: ASPEE Agribusiness Management Institute, Navsari Agricultural University, Navsari, 396450, Gujarat

Cultivar / Variety name: Cereals, fresh and processed fruits & vegetables

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

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References

- [1] Agri Exchange retrieved from <http://agriexchange.apeda.gov.in/>
- [2] Balassa B. (1965) *Trade liberalization and "revealed" comparative advantage*. *The Manchester School*, 33, 99-123.
- [3] Hinloopen J., Van Marrewijk C. (2001) *Weltwirtschaftliches Archiv*, 137,1-35.
- [4] Leua A., Gamit P., Singh N. and Parmar G. (2017) *Indian Journal of Economics and Development*, 13(2), 705-709.
- [5] United States Department of Agriculture. retrieved from <https://www.fas.usda.gov/data>.